

Once Daily Milking and Feeding level Combined Effects on Dairy Goat Welfare in Late Lactation

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Context of the study

Social

- Workload is continuously increasing in dairy herd
 - Twice daily milking (TDM) represents 50% of daily labor time in dairy cows herd from France (Chauvat et al., 2003)
- Is Once daily milking (**ODM**) a solution? (for workload reduction)

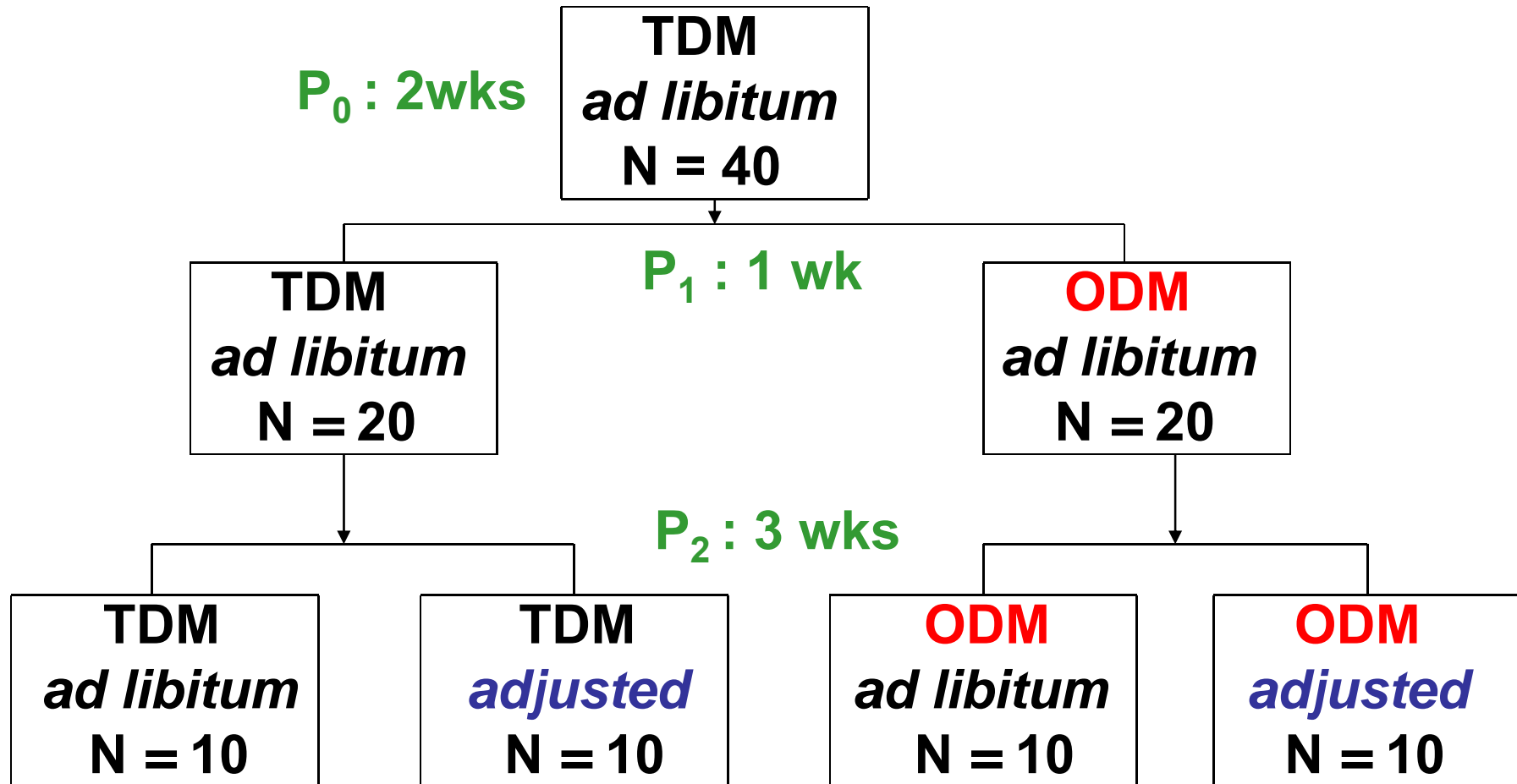
Scientific (TDM vs **ODM** in goat)

- Milk loss : 6 to 18%, for the last 10 years (Canarian, Spanish & French studies; Capote, 1999; Salama et al., 2003; Lefrileux et al., 2008)
 - **Ø data on behavioral responses** (at milking, time-budget)
- Stressful effect ? (milk storage in udder up to 24 hr)

Aims of the study: *TDM* vs *ODM* in goat

- 1. Behavioral response at milking (ruminating, back hunching, foot moving, foot moving at least twice or kicking)**
- 2. Behavioral response during the day: time- budget (time spent eating or drinking, total time spent standing, lying or getting up)**
- 3. Physiologic response: plasma cortisol level before morning milking**
- 4. Zootechnical response: milk yield, dry matter intake (DMI)**

Trial design



All goats: 239 days in milk- housed in individual pens-
milk yield (2.3 kg.d⁻¹)- DMI (2.7 kg.d⁻¹)

Trial approach

- **On 40 goats:**

- Behavioral response at morning milking (first 5s)
: twice a week + 2 observations at the beginning of P1
(Chi-square test)

- Stress physiology: plasmatic cortisol twice a week before morning milking (Proc mixed, SAS)

- Milk yield (5 d/wk) and DMI each day (Proc mixed, SAS)

- **On 16 goats:**

- Time-budget: once per period (24 h videos analysed with The Observer[®]) (GLM, SAS)

Trial approach



Results 1: *Milk yield, DMI and cortisol level during P1*

	Milking Frequency	
	TDM	ODM
Milk yield (kg.d ⁻¹)	2.2 ^a	1.8 ^b
DMI (kg.d ⁻¹)	2.7 ^a	2.7 ^a
Cortisol (ng.mL ⁻¹)	10.8 ^a	10.6 ^a

Milk loss due to ODM: 18%

No effect of ODM management on DMI or cortisol level

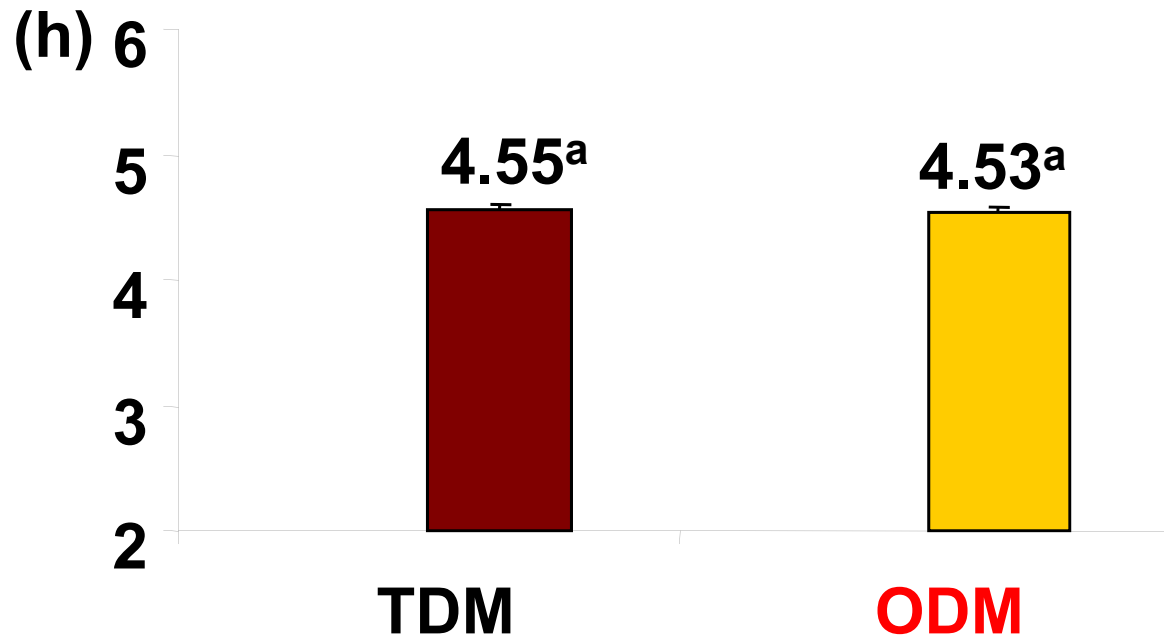
Results 1: Behavioral response *at milking* during P1

¹ Percentage of goat performing	Immediate		Late	
	TDM	ODM	TDM	ODM
Ruminating	32	= 35	27	= 22
Back hunching	85	= 85	92	= 92
Kicking	5	= 5	7	= 2

¹over 40 observations for each group

No effect of ODM management (also on foot moving)

Results 1: *No effect of ODM management on the time spent eating **during the day** in P1*



No effect of ODM management on:
-Time spent drinking
-Total time spent standing, lying or getting up

Results 2: *Milk yield, DMI and cortisol level during P2*

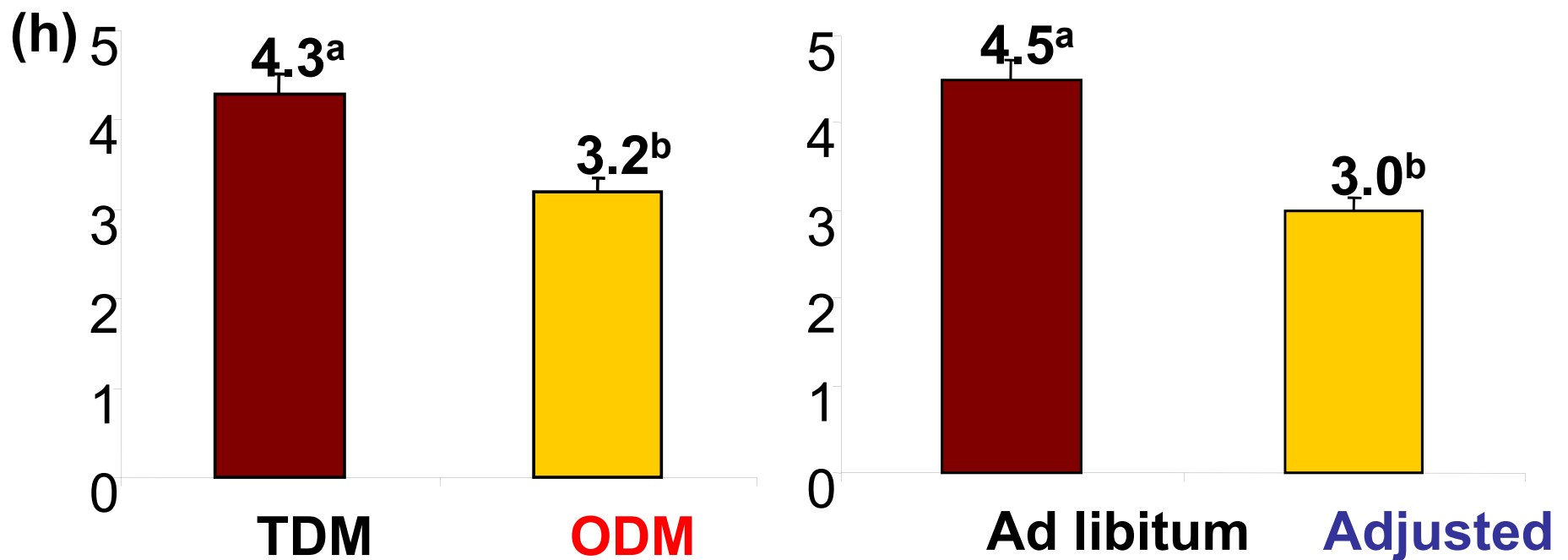
	Milking Frequency		Feeding level	
	TDM	ODM	AL	AD
Milk yield (kg.d ⁻¹)	1.9 ^a	1.5 ^b	1.7 ^a	1.7 ^a
DMI (kg.d ⁻¹)	2.5 ^a	2.2 ^b	2.8 ^a	2.0 ^b
Cortisol (ng.mL ⁻¹)	11.0 ^a	11.3 ^a	11.4 ^a	11.0 ^a

Milk loss due to ODM: 21%

DMI decrease due to ODM: 12%, feeding adjustment: 28%

No significant interaction between milking frequency and feeding level for the three variables

Results 2: Reduction of *the time spent eating by ODM or feed adjustment during the day* in P2



No significant interactions between the treatments
No effect of the milking or feeding treatment on:
-Time spent drinking
-Total time spent standing, lying or getting up

Conclusions

- For **physiological** point of view, no evidence of stress before milking in goats under ODM or feeding adjustment management in late lactation
- For **behavioral** point of view, no evidence of discomfort in goats at the onset of milking or throughout the day under ODM or feeding adjustment management in late lactation
- For **zootechnical** point of view, goats reduced their milk yield and DMI under ODM management, or their DMI under feeding adjustment management in late lactation

Thank you for your attention !



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